



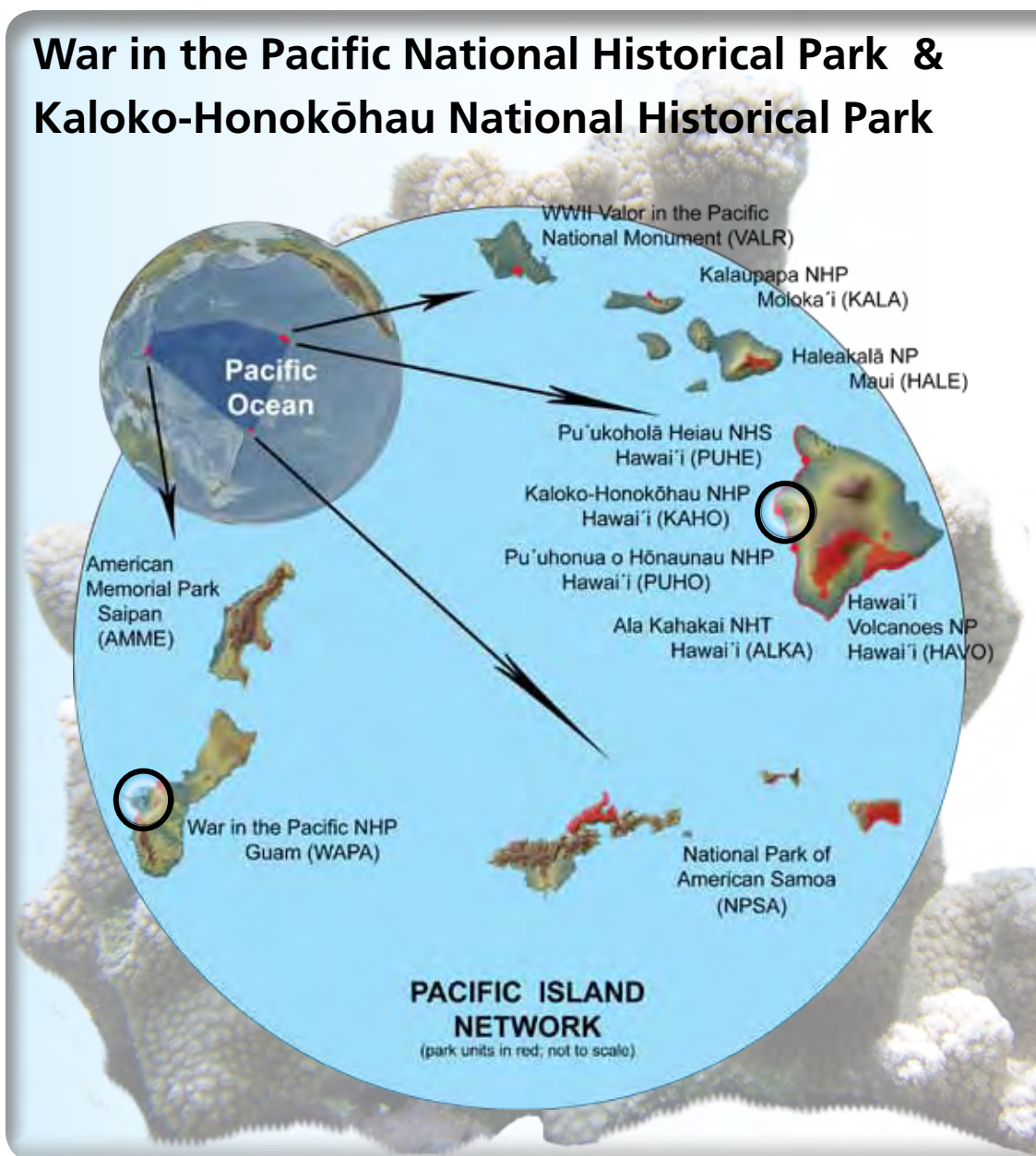
Pacific Island Network Quarterly

Quarterly Newsletter of the
Pacific Island Network (PACN)
Inventory & Monitoring Program
April – June 2009, Issue no. 16



Special Edition **PACN Coral Reefs, part 2**

War in the Pacific National Historical Park & Kaloko-Honokōhau National Historical Park



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PACN Coral Reefs, part 2 wraps up our special coral reef series with Kaloko-Honokōhau NHP and War in the Pacific NHP.

We take you on a quick and easy journey to a basic understanding of resources, issues, and threats facing two of the National Park Service's most splendid coral reef parks.

**Featured
Resources
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Anne Farahi shares her experiences conducting freshwater stream animals monitoring at Haleakalā NP and Kalaupapa NHP.

**Notes from
the Field
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The National Park Service has implemented natural resource inventory and monitoring on a servicewide basis to ensure all park units possess the resource information needed for effective, science-based management, decision-making, and resource protection.

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Outreach and Staffing Update

Science Day and Outreach

The first ever Pacific Island Network Science Day was a success. On May 6 at the Kilauea Military Camp, park and cooperating scientists shared research and monitoring highlights from National Park Service (NPS) units throughout the region. Staff and superintendents from network parks as well as park partners attended and learned about current research in natural and cultural resources. In a subsequent survey, 90% of 19 respondents rated the meeting 'excellent' or 'good' and it fostered communication among staff and disciplines, including interpretation, hard and soft science. All agreed that the variety of disciplines was appropriate and the 15-20 minute presentation were the right length. Almost 70% thought that a Science Day should occur every year with a one-day format, although 37% thought more than one day was desirable.

This year's focus was on non-I&M park science; a format that was supported by the survey. Half of respondents felt that all parks were not adequately represented. A question asking who should attend was strongly supportive of Natural Resource Chiefs, Superintendents, Cultural Resource Chiefs, and Interpretation Chiefs, with a majority also supporting the attendance of staff and non-NPS scientists working in the parks. 82% of respondents thought the hard science focus was just right but wanted more interdisciplinary communication, resource management applications, and discussion.

Our take home message is that we should try to plan a Science Day every year and continue to strive for inclusiveness and communication across parks and disciplines. For more survey results go to www.surveymonkey.com, log in

as "I&M" with password "PACN", then go to “My Surveys” and select “Analyze”.

I&M also participated in the annual PUHO cultural festival. This year I&M added an Anabat detector to the display to demonstrate and audibilize the collection of bat calls. The program reached out to an estimated 250 festival visitors.

Staffing Update

NPS: Interviews are underway for a Vegetation biotech position, and we hope that the position will be filled soon.

A plethora of volunteers have joined the program this summer. Paul Correro, Justin Hay, and others have teamed up with stalwart volunteer Chris Seliga to conduct fieldwork for insect bats data collection. In addition, Rachel Addlesberger and Jeannine Rossa have been working dilligently in the field for the Freshwater animals protocols.

CESU: Anne Farahi has undertaken a temporary position with the aquatic monitoring team for the summer as a UH Manoa casual employee. Welcome back Anne. It's like you never even left.

Bat biologist Heather Fraser rejoined I&M on a part-time basis from her new home in Illinois. She will continue to guide the Insectivorous Bats Monitoring Protocol through its final stages while simultaneously enjoying many cobs of famous midwestern sweetcorn.

Finally, Seth Judge has been hired on to the program for the month of July to aid with various aspects of vertebrate protocols development.

Calendar & Events

July 12-18 = Benthic marine monitoring at KALA
July 21-23 = I&M program review
July 28-30 = Hawaii Conservation Conference in Honolulu
August 17-31 = Univ. of Maryland IAN group comes to PACN to hold meetings on conceptual models and condition assessments
August = I&M will participate in the PUHE cultural festival
August 2-8 = Benthic marine monitoring at KALA
August 16-28 = Stream monitoring at KALA
Sept. 6-27 = Stream monitoring at NPSA

Inventory Update

Legacy Rat Surveys for Hawai'i Volcanoes NP

From 1986–1990 rodents were surveyed at HAVO to determine seasonal and geographical distribution patterns for four introduced species: black rat (*Rattus rattus*), Polynesian rat (*R. exulans*), Norway rat (*R. norvegicus*), and house mouse (*Mus musculus*). Surveys took place along an elevation gradient ranging from 90–1,820 m above sea level in five different sites that ranged from dry coastal areas to montane wet forest. Due to personnel changes and funding shortages, the results of some parts of this study were not published after fieldwork was completed. The PACN funded data analysis and write-up of the study which provides valuable baseline data for these vertebrate pests in the park. The report has been submitted to the PCSU Technical Report series



Rats are a threat to plants and animals, chewing fruit and bark, and predating on ground nesting birds.



and will soon be available at:
<http://www.botany.hawaii.edu/faculty/duffy/techrep.htm>.

GIS Update

What is the difference between a projection and a coordinate system?

The earth is covered with a 3-dimensional grid of latitude and longitude. This grid provides the basis for a geographic coordinate system where every point on earth is identified by its latitude and longitude values. Projection is the method of applying mathematic formulas to “project” the 3-dimensional lat/long grid onto a 2-dimensional flat surface of a map. The result of this transformation is a projected coordinate system where each point on earth is now identified by a pair of XY coordinates. X represents the “projected” longitude value and Y the “projected” latitude value.

There are several types of projected coordinate systems. Universal Tranverse Mercator (UTM) is one of the most common. UTM divides the earth into 60 zones pole-to-pole. The letter N or S following the zone number indicates whether the area is in the northern or southern hemisphere.

Coordinate systems are not complete without their reference datums. A datum is a set of

geodetic measurements/parameters used to determine the “best fit” position of a particular coordinate system on the curved surface of the earth. North American Datum of 1983 (NAD 83) and World Geodetic System 1984 (WGS 84) are two commonly used datums in North America and the Pacific Ocean region.

GIS users often use the terms projection and coordinate system interchangeably. This should be avoided because projection only refers to the mathematical process, not the actual coordinate system or datum. For example, instead of “What’s the projection of this trail layer?” the appropriate question should be “What’s the coordinate system of this trail layer?”

Standard coordinate systems for the eleven PACN Parks:

ALKA (Big Island) – NAD83 UTM Zone 5N
AMME (Saipan) – WGS84 UTM Zone 55N
HALE (Maui) – NAD83 UTM Zone 4N
HAVO (Big Island) – NAD83 UTM Zone 5N
KAHO (Big Island) – NAD83 UTM Zone 5N (technically Zone 4N)
KALA (Moloka'i) – NAD83 UTM Zone 4N
NPSA (American Samoa) – WGS84 UTM Zone 2S

Featured Staff

Alison Ainsworth

Botanist
Alison returned to the National Park Service in May 2009 as the Pacific Island Network botanist. Prior to joining the PACN team, she worked with vegetation and resource management in Hawaii for over thirteen years. She completed her BS in Resource Ecology and Management at the University of Michigan where she was inspired to work with tropical vegetation by her botany professor, Hawaiian fern expert Dr. Wagner. Despite her botanical background, she began her career in Hawaii working with hawksbill sea turtles at Hawai'i Volcanoes National Park. After a couple of years with the charismatic megafauna, she was hired to coordinate vegetation monitoring programs for the next five years. Alison earned her MS from Oregon State University in 2007 where she studied vegetation recovery following lava-ignited wildfires in Hawai'i Volcanoes National Park. While completing her thesis she worked as a PACN cooperator assisting with the development of the vegetation protocols. During the past two years, she broadened her botanical skills while working for the State of Hawaii's Division of Forestry and Wildlife. Alison is excited to return to the National Park Service and begin implementation of the vegetation monitoring protocols throughout the Pacific Island Network.



PUHE (Big Island) – NAD83 UTM Zone 5N
PUHO (Big Island) – NAD83 UTM Zone 5N
VALR (O'ahu) – NAD83 UTM Zone 4N
WAPA (Guam) – WGS84 UTM Zone 55N

For more information on coordinate systems for I&M GIS data, contact: viet_doan<a>contractor.nps.gov

Coral Reefs at Kaloko-Honokōhau National Historical Park

The coral reefs of Kaloko-Honokōhau National Historical Park are an integral part of an ancient Hawaiian coastal settlement that includes over 250 archeological sites and three large fishponds traditionally used for fish aquaculture. Park waters receive significant groundwater inputs that deliver nutrients to the coral reef, but also provide lower salinity nursery habitat for several culturally important fish species.

Major Threats

- Overfishing
- Urbanization / non-point source pollution
- Physical damage from overuse

The park is surrounded on two sides by heavy urban development



Status and Trends: Coral reef monitoring began in 2001. Coral cover at 30 monitoring sites was moderately high (32%) with low levels of coral disease in 2007. The rate of coral recruitment (arrival of juveniles) has been extremely low in the last few years, and is a concern. Relatively low cover (10%) of macroalgae suggest that herbivorous fish, invertebrates, and marine turtles may be helping to control algal overgrowth of corals.

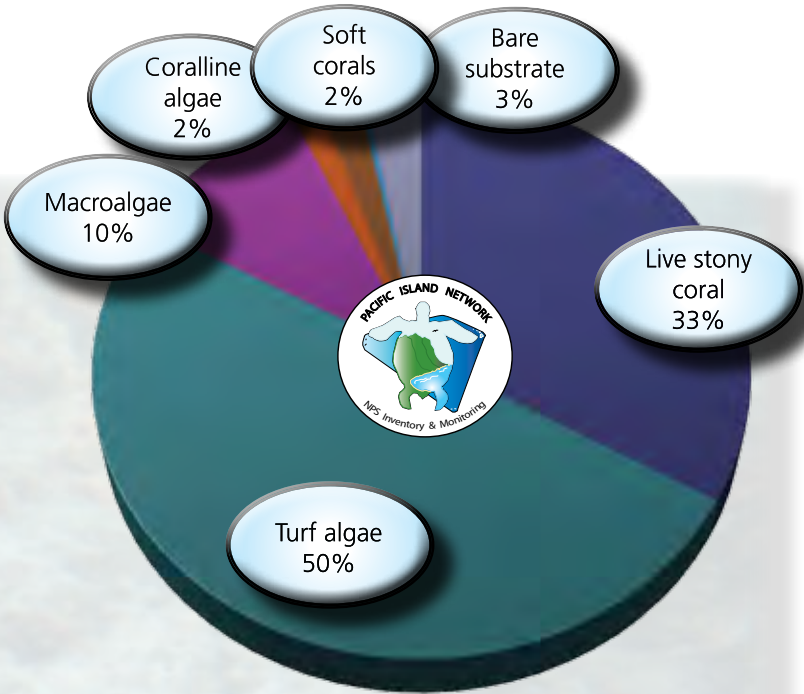


The reef is heavily used by tourists, fishers, and recreational boaters



Many species, such as this blenny, use corals for shelter

Action: The state of Hawaii manages fisheries within the park. Fishing for the aquarium-fish trade is banned and lay-gill nets must be handmade of local fibers. All other fishing that is consistent with state regulations is allowed, . Data on fisheries harvest are needed. Protection of ground water from excess nutrient and urban contaminant inputs is a primary focus of park management. Two alien marine species, an alga and a jellyfish, have invaded Kaloko fishpond but have not yet been found on the adjacent reef. Monitoring and control of these species is ongoing.



Composition of selected coral reefs in Kaloko-Honokōhau National Historical Park

Fast Facts

- Adult corals are relatively healthy, but natural replenishment of juvenile corals has been low for several years
- There is a resident population of threatened juvenile green sea turtles
- Urban development impacts ground-water quality and coral reefs in the park

This Hawaiian fishpond is a testament to the fact that humans have been altering the near shore marine environment for generations



Once harvested throughout the Pacific, the green sea turtle is now fairly common on park reefs



Coral Reefs at War in the Pacific National Historical Park

War in the Pacific National Historical Park has one of the highest levels of species diversity within the national park system, including one of the most diverse coral reefs. The park was established to commemorate the men and women who fought and served in the battlegrounds of Guam during World War II. Bomb holes that once scarred the sea floor are now covered with coral and algae and serve as habitat for a diversity of fishes and marine invertebrates. Unexploded ordnance and empty shell casings rest silently on the sea floor to remind divers of the fierce battles that took place during World War II.

Major Threats

- Overfishing
- Sedimentation
- Watershed development

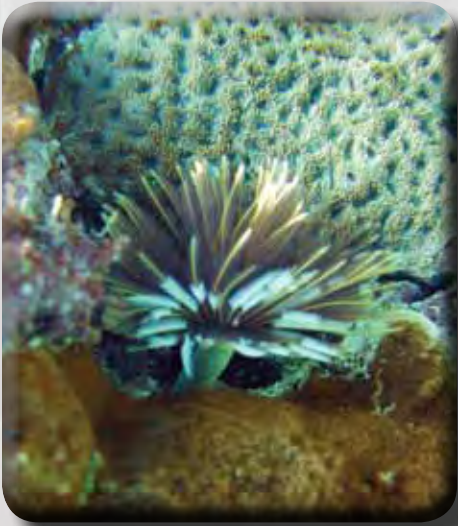


An NPS scientist taking measurements of an eroded landscape which has led to massive sedimentation on the reefs

Status and Trends: Coral reef monitoring began in 2008. Live coral cover at 30 monitoring sites was moderately high (27%). Sedimentation and its impacts on coral reefs is a continuing major concern. Coral recruitment (arrival of juveniles) in the park has been extremely low over the last several years. Monitoring data have shown six percent cover of crustose coralline algae, a critical settlement surface for juvenile corals and many other reef organisms, and important for maintaining reef structure. Thirteen percent cover of macroalgae suggests that at least some herbivorous fish or invertebrate populations need protection in order to help prevent algae overgrowth on coral.

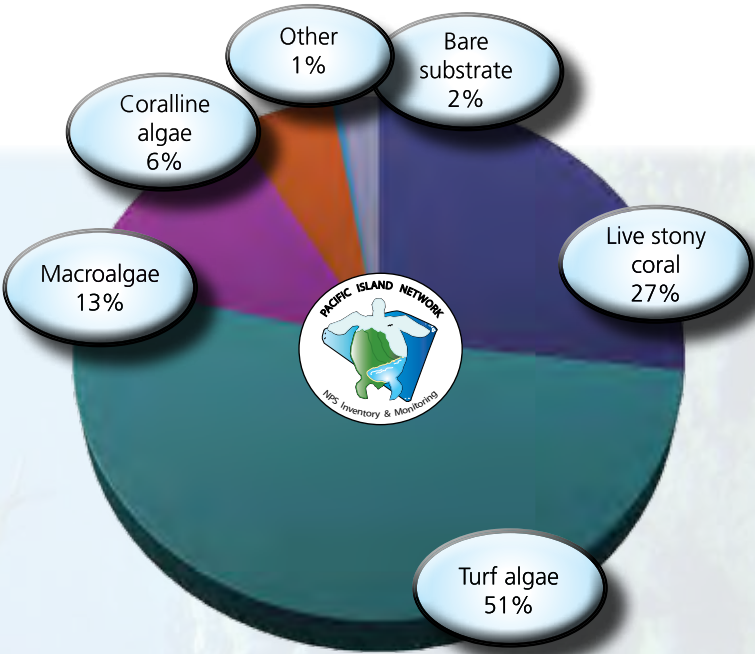


A stingray makes its home along the reef in Agat Bay



This feather plume worm sweeps up small particles and helps to keep reefs clean

Action: A subsistence fisheries harvest study has been conducted in the park. Coral reef and reef fish monitoring has been implemented by NPS and cooperators as has the monitoring of currents, tides, temperature, sedimentation, water quality, and coral recruitment. The park is experimenting with several methods for restoring eroded upland areas to reduce sediment loads on coral reefs along with monitoring off-road vehicle use in park watersheds which is associated with erosion.



Composition of selected coral reefs in War in the Pacific National Historical Park



Corals are becoming increasingly rare due to impacts from land-based sources

Fast Facts

- Fire and subsequent erosion in the uplands causes severe sedimentation impacts on coral reefs
- Coral recruitment (arrival of juveniles) is extremely low
- Harbor expansion adjacent to the park presents serious threats to coral reef resources



An anemone fish rests in the tentacles of its host anemone, where it is safe from potential predators

Map legend

- Park boundary (authorized)
- Coral reef





ANNE FARAHI

Notes from the Field

The Glamorous World of Stream Monitoring

When people hear I work in Hawaii in the water, a vision comes to mind of spending all day basking on beautiful beaches in a swimsuit. Little do they know that as a freshwater animals field technician I primarily wear a full 7mm wetsuit with hood, gloves, and booties. I spend most days hiking upwards of five miles with all kinds of crazy equipment and lying in a 22°C stream for hours on end counting and identifying creatures that call the streams home. There are five types of native gobies ('o'opu), two native crustaceans ('ōpae), and three native mollusk species that inhabit Hawaii's streams. Unfortunately, numerous introduced fish and a prawn (*Macrobrachium* lar) are also prevalent in the streams and pose a serious threat to native animals. We also monitor the habitat characteristics and water quality parameters that these animals inhabit and how those factors change over time. These data give us a better idea of changes to the ecosystem.

I initially came to Hawaii with grand hopes of studying charismatic marine megafauna like whales and turtles. However, I've discovered how important freshwater ecosystems are to the islands. Not only are they home to unique and often endemic organisms, but they also represent a key link between the terrestrial and marine environments.

This link is evident in the animals'

amphidromous life cycle. This means they utilize different environments during their lifetime. They exhibit diadromy, which literally means "two runs" describing how newly hatched larvae flow out to the ocean and return later to the streams as juveniles. Generally, juveniles migrate up the streams to a location they choose as their home and stay in that general area for the rest of their lives. These small, sensitive animals can be key indicators of the health of the streams because they may quickly show signs of human land use activities such as agriculture, development, and stream diversions.

On our most recent adventure to Waikolu stream in beautiful Kalaupapa National Historical Park we witnessed spat (juveniles) of a native snail species called hīhīwai (*Neritina granosa*) returning from the ocean and migrating up the streams. Groups of hundreds of individuals formed a line for their epic trek.

A crew of four intrepid stream ecologists also traveled to Haleakalā National Park for nearly two weeks of stream monitoring along four streams. We located many native species in these streams including a world-class climber 'o'opu alamo'o (*Lentipes concolor*). Similar to other gobies, this endemic species has a fused pelvic fin that forms a sucking disk enabling it to scale waterfalls. The alamo'o has been known to climb waterfalls as tall as 420 feet!

Field excursions are definitely not your typical Hawaiian "vacation," but I would not change a thing about my job or the amazing places in which I am so privileged to work.



Here I am with all my gear



Hundreds of hīhīwai return



Waikolu stream



'O'opu alamo'o